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INVITED REVIEW ARTICLE

Recent results in the theory and applications of CARMA processes

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Abstract Just as ARMA processes play a central role in the representation of stationary time series with discrete time parameter, $(Y_n)_{n\in\mathbb{Z}}$, CARMA processes play an analogous role in the representation of stationary time series with continuous time parameter, $(Y(t))_{t\in\mathbb{R}}$. Lévy-driven CARMA processes permit the modelling of heavy-tailed and asymmetric time series and incorporate both distributional and sample-path information. In this article we provide a review of the basic theory and applications, emphasizing developments which have occurred since the earlier review in Brockwell (2001a, In D. N. Shanbhag and C. R. Rao (Eds.), *Handbook of Statistics 19*; *Stochastic Processes*: *Theory and Methods* (pp. 249–276), Amsterdam: Elsevier).

Keywords Time series · Stationary process · CARMA process · Sampled process · High-frequency sampling · Inference · Prediction